

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 30A-92 764	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/EP2004/000929	International filing date (<i>day/month/year</i>) 02 . 02 . 2004	Priority date (<i>day/month/year</i>) 29 . 04 . 2003
International Patent Classification (IPC) or national classification and IPC		
Applicant COMPACT DYNAMICS GMBH		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
- ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s))

_____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/000929

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
 - ☐ international search (Rule 12.3 and 23.1(b))
 - ☐ publication of the international application (Rule 12.4)
 - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-13 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the claims:
 - nos. _____ as originally filed/furnished
 - nos.* _____ as amended (together with any statement) under Article 19
 - nos.* 1-18 received by this Authority on 16.03.2005 with the letter of 16.03.2005
 - nos.* _____ received by this Authority on _____
 - ☒ the drawings:
 - sheets 1/6-6/6 _____ as originally filed/furnished
 - sheets* _____ received by this Authority on _____
 - sheets* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims		NO
Inventive step (IS)	Claims	1-18	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

1. Document US5035360 (D2), which is regarded as the closest prior art, discloses (see figures 1 and 4b)

a fuel injection valve for fuel injection systems in internal combustion engines, for the direct injection of fuel into a combustion chamber of an internal combustion engine, comprising:

- a fuel inlet (92),
- an electrically controllable actuating device which co-operates with a valve arrangement (48) in order to allow fuel to flow through a fuel outlet (38) into the combustion chamber, the actuating device comprising an electrically powered magnetic coil assembly (106), a substantially soft magnetic yoke assembly (82) interacting therewith and a substantially soft magnetic armature assembly (62) interacting with the yoke assembly, the magnetic yoke assembly (82) comprising a plurality of pole segments (82, 86), which
 - are at least partly enveloped by electromagnetic coil assemblies (106),

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which are configured to divert opposing electric currents on opposite sides of the pole segments,

- are substantially polygonal in shape, are arranged adjacent one another with spaces therebetween for accommodating the electromagnetic coil assemblies and are arranged parallel to one another.

The subject matter of claim 1 differs therefrom in that the pole segments are not enveloped by an electromagnetic coil assembly in a meander-like manner.

2. The present invention can therefore be considered to address the problem of producing a simpler, cheaper and more compact injection valve.
3. That problem is solved by the distinguishing features specified under point 1. These make it possible, in an efficient production method, to arrange between two layers of sheet metal containing soft iron a current conducting strip for forming the magnetic coil assembly and a sheet metal strip containing soft iron for forming a stator-yoke back. The current-conducting strip and the sheet metal strip containing soft iron thus adjoin one another on at least one longitudinal edge of each in an electrically insulated manner.

Document US4156506 (D4) discloses an injection

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valve with a single meandering pole segment (see figure 5). The arrangement therein solves problems different from that solved by the present application and is geometrically too far removed for it to be possible to combine the two documents mentioned.

4. The subject matter of dependent claims 2-18 is considered novel and inventive, since those claims contain further embodiments of the injection valve according to claim 1.
5. Claims 1-18 thus satisfy the criterion in PCT Article 33(1).